CLAIMS

1. A gauge for measuring a liquid level comprising:

a rotatable sensing disc for magnetically coupling with a tank magnet, the tank magnet being rotatable to a position corresponding to the liquid level, the sensing disc having a sensing magnet embedded therein for magnetically coupling with and rotating in response to the tank magnet;

an optical rotary position encoder;

the sensing disc being connected to the optical rotary position encoder;

the optical rotary position encoder having an encoder pad adapted for movement responsive to rotation of the sensing magnet;

the optical rotary position encoder having at least one optical sensor generating at least one gauge signal responsive to the position of the encoder pad; and

an enclosure having a base and a housing for housing the sensing magnet and the optical rotary position encoder.

2. The gauge of claim 1, wherein the encoder pad comprises a disc having a face, the face having a plurality of encoder arrays each encoder array being defined by a first angular position and a second angular position, each encoder array containing a plurality of cells, each cell being further defined within the encoder array by a first radius and a second radius, and each cell having a radial midpoint defined as the radial point between the first radius and the second radius.

3. The gauge of claim 2, wherein each cell is capable of allowing the passage of light or blocking the passage of light, defining a condition.

4. The gauge of claim 3, wherein the optical sensor comprises:

an array of photoemitters comprising one or more single beam emitters for emitting one or more single beams; and an array of photodiodes comprising one or more single beam photodiodes for receiving the one or more single beams and generating a corresponding a gauge signal;

the one or more of single beam photoemitters, the one or more single beam photodiodes, and the one or more of single beams corresponding to the one or more cells contained in an encoder array of the encoder pad;

each of the one or more single beam photoemitters having a designated cell range and a designated single beam photodiode for responding to the condition of a cell within the designated cell range and being aligned at radial lengths corresponding to the designated cell range; and

wherein the array of photoemitters and the array of photodiodes are positioned at a fixed angular position about the face of the encoder pad such that each single beam of the one or more single beams travels along a path from the single beam emitter through the radial midpoint of its designated cell range to a corresponding designated single beam photodiode.

5. The gauge of claim 1, wherein the encoder pad comprises a disc having a face, the face having fifteen encoder arrays, each encoder array being defined by a first angular position and a second angular position and consuming equal areas of the face of the encoder pad; each encoder array comprising four cells, each cell being further defined within the encoder array by a first radius and a second radius; and each cell having a radial midpoint defined as the radial point between the first radius and the second radius.

6. The gauge of claim 5, wherein each cell is either capable of allowing the passage of light or blocking the passage of light and defines a condition corresponding to one or the other of blocking the light or allowing the passage of light.

7. The gauge of claim 6, wherein the optical sensor comprises:

an array of photoemitters containing four single beam emitters, each single beam emitter emitting a single beam; and

an array of photodiodes containing four single beam photodiodes for receiving the single beams and generating four gauge signals, each gauge signal corresponding to the condition of the cell;

wherein each of the four single beam photoemitters has a designated cell range and a corresponding designated single beam photodiode for sensing to the condition of a cell within the designated cell range;

each of the four single beam photoemitters being aligned at radial lengths corresponding to the designated cell range; and

wherein the array of photoemitters and photodiodes positioned at a fixed angular position about the face of the encoder pad such that each single beam travels along a path from the single beam emitter through the radial midpoint of its designated cell range to its designated single beam photodiode.

8. The gauge of claim 1, further comprising:

at least one microcontroller or sequencer for receiving and interpreting at least one of the gauge signals, generating at least one command signal, generating at least one translated sense signal, and driving a first transmitter or transceiver.

9. The gauge of claim 4, further comprising:

at least one microcontroller or sequencer for receiving and interpreting at least one of the gauge signals, generating at least one command signal, generating at least one translated sense signal, and driving a first transmitter or transceiver.

10. The gauge of claim 7, further comprising:

at least one microcontroller or sequencer for receiving and interpreting at least one of the gauge signals, generating at least one command signal, generating at least one translated sense signal, and driving a first transmitter or transceiver.

11. A system for remotely sensing liquid level comprising:

a gauge for providing at least one gauge signal;

at least one microcontroller or sequencer for receiving and interpreting at least one of the gauge signals, generating at least one command signal, generating at least one translated sense signals, and driving a first transmitter or transceiver;

one or more remote transmitters or transceivers for communicating with at least one of the microcontrollers through the first transmitter or transceiver; and

a user interface coupled with one or more of the remote transmitters or transceivers for interpreting at least one of the translated sense signals and generating at least one humanly perceivable output.

12 The system of claim 11, wherein the gauge comprises the gauge of claim 1.

13. The system of claim 11, wherein the gauge comprises the gauge of claim 7.

14. The system of claim 12, wherein one of the microcontrollers or sequencers powers the optical sensor, receives a BCD or binary word from the gauge signals, processes the BCD or binary word in accordance with a control scheme, and, in further accordance

with the control scheme, drives the first transceiver and transmits one or more translated sense signals; the first transceiver being wireless phone transceiver for communicating with the user interface at a remote location through a wireless network.

15. The system of claim 13, wherein one of the microcontrollers or sequencers powers the optical sensor, receives a BCD or binary word from the gauge signals, processes the BCD or binary word in accordance with a control scheme, and, in further accordance with the control scheme, drives the first transceiver and transmits one or more translated sense signals; the first transceiver being wireless phone transceiver for communicating with the user interface at a remote location through a wireless network.

16. The system of claim 12, wherein one of the microcontrollers or sequencers, in response to a request from the remote location, powers the optical sensor, receives a BCD or binary word from the gauge signals, processes the BCD or binary word in accordance with a control scheme, and, in further accordance with the control scheme, drives the first transceiver and transmits one or more translated sense signals; the first transceiver being wireless phone transceiver for communicating with the user interface at a remote location through a wireless network.

17. The system of claim 13, wherein one of the microcontrollers or sequencers, in response to a request from the remote location, powers the optical sensor, receives a BCD or binary word from the gauge signals, processes the BCD or binary word in accordance with a control scheme, and, in further accordance with the control scheme, drives the first transceiver and transmits one or more translated sense signals; the first transceiver being wireless phone transceiver for communicating with the user interface at a remote location through a wireless network.

18. A method of improving logistical efficiencies associated with the delivery of LPG or fuel oil to a number of remotely dispersed tanks over a geographic area comprising:

sensing the liquid level in at least one tank;

transmitting at least one signal conveying a tank identifying indicia and a liquid level relating to the identified tank;

receiving at least one signal conveying the tank identifying indicia and the liquid level relating to the identified tank;

correlating the tank identifying indicia and the liquid level relating to the identified tank with a geographical location for the tank;

grouping the tank identifying indicia and the liquid level relating to the identified tank with the geographical location for the tank in a unique data array;

storing the unique data array in a database containing a plurality of data arrays;

sorting and/or filtering the data arrays within the database by liquid level and/or geographical location to create a sorted and/or filtered database; and

identifying at least one delivery route through a region that encompasses at least one of the geographical locations present in the filtered database.